

Claims

1. A fuel cell reactant gas flow field plate for inclusion in a stack of fuel cells to form a fuel cell power plant, said plate having a plurality of grooves forming reactant gas flow channels, said channels having inlet ends and outlet ends for conducting reactant 5 gas along a longitudinal flow direction extending between said inlet ends and said outlet ends;

10 said flow field plate having a flow inlet edge and a flow outlet edge, each of said channels including either or both of (a) an inlet portion extending longitudinally from, at or near said inlet edge and (b) an outlet portion extending longitudinally from, at or near said outlet edge, each of said channels having a transverse portion extending substantially transversely of said longitudinal direction and in fluid communication either (c) with only one of said inlet portions or only one of said outlet portions, or (d) between one of said inlet 15 portions and one of said outlet portions, so that said inlet portions are laterally offset from said outlet portions;

characterized by the improvement comprising:
some, but less than all of said transverse portions having more than one groove.

2. A flow field plate according to claim 1 wherein:
said channels are flow-through channels and each of said transverse portions is in fluid communication between one of said inlet portions and one of said outlet portions.

3. A flow field plate according to claim 1 wherein:
said channels are interdigitated and each of said transverse
portions includes at least one groove in fluid communication between
(a) a first part of one inlet portion and a second part of said one inlet
5 portion which is transverse from said first part of said one inlet
portion or (b) a first part of one outlet portion and a second part of
said one outlet portion which is transverse to said first part of said
one outlet portion.

4. A flow field plate according to claim 3 wherein:
some of said transverse portions include at least one groove
which is in fluid communication with only one part of either (a) one
of said inlet portions or (b) one of said outlet portions.

5. A flow field plate according to claim 1 wherein:
all of said transverse portions together form a transverse flow
field area having a length in said longitudinal direction and a width
transverse of said longitudinal direction, and a ratio of the number of
5 grooves in said transverse flow field area to the number of transverse
channel portions in said transverse flow field area is on the order of
an aspect ratio of the length or width of said transverse flow field
area to the width or length of said transverse flow field area.

6. A flow field plate according to claim 1 wherein:
less than all of said transverse portions have more than one
groove.

7. A flow field plate according to claim 1 wherein:
some of said transverse portions have two grooves.

8. A flow field plate according to claim 1 wherein:
none of said transverse portions have more than two
grooves.

9. A flow field plate according to claim 1 wherein:
said plate has at least one hole therein; each hole for forming,
with similar holes of additional plates, an internal manifold, each hole
having two dimensions which are at least several times said groove
5 width; and
said inlet portions are offset from said outlet portions to clear
said holes.